VOL. XX] [No. 5.

THE

INDIAN FORESTER;

A MONTHLY MAGAZINE

OF

FORESTRY,

AGRICULTURE, SHIKAR & TRAVEL

EDITED BY

J. S. GAMBLE, M.A., F. L. S.,

CONSERVATOR OF FORESTS, AND DIRECTOR OF THE FOREST SCHOOL, DEHRA DÚN.

X 143

MAY, 1894.

MUSSOORIE.

PRINTED BY THE MAFASILITE PRINTING WORKS COMPANY, "LIMITED."

1894.

143

Contents.

No. 5—May, 1894.

Page

I.—Original Articles and Translations.

Alluvion and Diluvion, by B. H. B.-P. ... 168
Utilization of the less valuable Trees, by Col. Campbell-Walker 172
Damage done to Himalayan Pines by Loranthaceous Parasites 177
Albizzia lophantha as a 'reboisement' plant ... 178

II.—Correspondence.

Revolution in Systematic fire production of Forests, letter from 'Jo-hukam' 178
The Grading of Rangers, letter from C. E. Muriel ... 179

III.—Official Papers and Intelligence.

Notes on Forest tram-lines and wire lines in Germany and Switzerland, by H. L. Porter ... 180
Rules for the training of Junior Assistant Conservators in Madras 184

IV.—Reviews.

'Le traitement des bois en France,' Review by W. R. Fisher 187
The Annual Forest Administration Report for Madras for 1892-93. 190
The 'Timber Trades Journal,' Special issue, No. 19 194

VI.—Extracts, Notes and Queries.

A Forest School for Ceylon 198
Artificial indiarubber from Cotton Seed 198
Mercantile aspect of Forestry 298
Seeding of Forest trees 200

VII.—Timber and Produce Trade.

The Indian Timber Trade 200
Churchill and Sim's Circular. April 5, 1894 ... 203
Market Rates of Produce 203
The Teak Market 204
Cawnpore Price Current 204
Statement of average selling rates in the N.-W. Provinces, March 21st 1894. 205

VIII.—Extracts from Official Gazettes.

Supplement.

Climatic Influence of Forests.

X

THE

INDIAN FORESTER.

Vol. XX.] May, 1894. [No. 5

Alluvion and Diluvion.

In the *Indian Forester* for February 1894, a correspondent (G. E. M.) on the subject of "Protected Forests," (p. 59) asked a question about the *Rule of alluvial additions* to *Forest estates*, which I will endeavour to answer, as he requests. I have not heard yet of any attempt to replace the old Bengal Regulation XI of 1825, which is still the General Law on the subject.

On Alluvion.—The defect of this Regulation is, that it allows its own rules as to ownership to be over-ridden in all cases where there is any other rule of *local custom*. Now, in a country, like the Panjáb or Sindh, where there are many rivers, or at any rate a great deal of river action going on, there are pretty sure to be *customs*, and these customs are usually very various and quite unsuited to modern requirements, such as the local customary rule that the 'deep stream' was always the boundary, and that a man lost his land if the river changed. Clearly this was due to old days of feuds and wars, when the owners were kept from each other's throats only by an unfordable stream between them! And the customs were, in fact, invented in old days, when, owing to the hostility of tribes, villages and petty States or kingdoms, special arrangements were needed, in case a village separated at one time from its neighbour by a stream should become united to it by that stream changing course. But I cannot go into the whole subject of alluvial law, and will come at once to the particular point in question.

The action of rivers coming down from the hills on to comparatively soft and nearly level alluvial plains is not difficult to understand. They have no real bed, for at least a part of their course: as they rise with the melting of mountain-snows, or the 'monsoon' rains, they spread abroad and again decrease, splitting up into a number of branches in so doing, because the tendency of the main stream, laden with alluvial mud, is always to pile up the central bed to a slightly higher level than the rest. This level being overtopped in a high flood, the water must flow

away on this side and on that as the obstacles of nature and the lines of least resistance suggest. Practically, two chief results are found to affect riverain property. In the one case (1) small and gentle accretions of soil are found to form up in front ('mahâz' is the native term) of the existing front; or the reverse action may take place, and little by little the area is cut away. Or, (2) a more marked change may take place, which the old Roman writers fancifully called 'avulsion': here the land itself remains, (except so far as its surface may be swept over and injured); what happens is that the stream which before flowed in *front* of an estate now flows *behind* it, or on some other side; and hence what was once a river bed, becomes (in time) dry land, and two estates formerly separated are now close neighbours; and here probably the deserted bed will be divided between them. Of course it is not possible that an area on one side of a river should really be torn off, and float houses, trees and all over to the other side, though this is implied by the word 'avulsion,' it is the river course that changes, not the land.

Of course it is not always easy to tell what is going on. For a stream may really be changing its course, and yet do so little by little that the changes appear to be cases of accretion and diminution, and each flood-season takes the water a little further; with the effect that the—(A) Estate on one bank seems to be (at the moment) only gaining a little by accretion, and the opposite estate (B) losing a little: but in time, the whole of B is gone; and if the river continues retreating, A has now become increased by the entire area, which was once B, or at least by so much of it as is not still occupied by the new course of the shifting river. It is in a case of this sort that the question noted by your correspondent arises. It has also frequently occurred, in cases when the *general* direction of the river has not suddenly altered, but still there is a slight tendency to move one way or the other locally. In such a case there may be two villages X and Y; at present Y is the riparian (or riverain) village and X is just behind it (inland), and therefore has no river frontage; but as the river slowly changes, Y is gradually eaten away, and in time X *becomes* the riparian. After a time a reverse action sets in, and the water slowly retires from X, or in other words new soil appears on the river front little by little.

Now the ordinary and well-known rule of law is that an accretion or "accessory" follows the same right of property as the principal. If a tree is mine, so (in the absence of express arrangements otherwise) is the fruit; and so will a cow and its calf. On exactly the same principle, a gradual accretion of mud, which in time hardens on to my frontier and increases my area is in general an 'accessory.' It seems to come out of the river bed; and actually the estate opposite (on the other side) may not be suffering diminution, for the corresponding loss may be going on

somewhere else and in several places. The object of the procedure for constituting a State (Reserved) or Protected Forest, is not, of course, to *create* proprietary right in the Government where it did not exist before (I mean in general; for part of the procedure may be to obviate inconvenience by buying out little plots of private land and so acquiring the whole, and creating a proprietary right, but I refer to the effect on the area as a whole), but to define its limits, to dispose of claims to easements and other rights which might, if unknown and unprovided for, render management impossible, and above all to announce that special protective rules of law will take effect within those limits which do not apply outside them. Consequently, the *gradual* increments on the river side, where in the nature of things there is no human neighbour, would hardly call for any fresh notification. Whenever an increment belongs to any tenure, all the incidents of the principal tenure attach to it (see Indian Law Reports, Calcutta Series, Vol. VII. 479.) The increment is clearly the property of the State, because the principal thing is. If, however, there were to be a permanent and large increase, it *might* be perhaps found best to *notify* it as Forest, because, though the *river* front or boundary would present no difficulty, neighbours on the other side might encroach, or begin to drive cattle to graze, or to cut 'tamarisk' on the new ground, and it would be desirable to declare it unmistakeably *under* the Forest Law; and as no rights could possibly exist, the procedure under Chapter II would be merely formal. But here comes the second part of the question. It is perfectly true that any gradual increment, large or small, to a riparian estate belongs to the estate: *but*, the case put by your correspondent, or illustrated by my villages X and Y (above) is different, for though truly X, formerly inland, has now *become*—though perhaps for forty years past—the riparian estate, still, it is known (and I assume *provable* by old maps, records, evidence, &c.) that Y *once* was there; so that the river lapping on X's shore and adding some strips of ground every season, is not merely *the river*: it is *water over Y's submerged village*—the *basis* of which is still in the depth below. Consequently, when land reappears on X's frontier, it is not a mere accretion to X, it is the *reappearance of Y*, and belongs to the owner of Y.

And this rule has been formally laid down by the Privy Council in the leading case of "*Lopez* versus *Modun-Thakoor*," reported in Moore's Indian Appeals.* It is the leading case

---

NOTE.—It will also be found reprinted in *Bengal Law Reports*, Vol. V, Privy Council Cases, page 521. Rattigan's (Punjab) Digest of Civil Law Chap. XIII gives a convenient *resumé* of the Alluvion Law, a great deal of which is not merely Punjab Law, but general, *e.g.*, the rule of right to *islands* not attached to either shore, and is equally good Law elsewhere.

well known to lawyers. There is a similar case in 4 Moore's Ind. Appeals, 403.

In the case put, it is not necessary to discuss whether the doctrine is applicable in India that a man's property goes "down to the centre of the earth," because in some cases it is does not, at least in the sense that mineral rights may belong to Government; but apart from that, there is no doubt that the *submersion* of any *known estate* by a river does not alter the ownership. In the case above alluded to, their Lordships said: "The site is the property; 'and the law knows no difference between a site covered by water 'and a site covered by crops, provided the ownership of the site 'be ascertained."

There is, therefore, no warrant for saying that in in the case of a *known* or *provable* forest area, disappearing under river flow, and afterwards re-emerging (in proximity to the village estate, once immediately behind it, inland) that "according to existing Rules the forest is gone for ever." No such rule is known to the law. Of course, the Government's right to the Forest area on its reappearing (or any other area) might be *again* lost, under the law of Limitation, by the owner omitting to claim it for twelve years after its reappearance, but that is quite another matter: and in the case of a Government estate, the loss would not occur till *sixty* years had elapsed instead of *twelve*, without any claim to the restored acres.

The *law* is quite clear: but the practice may be different. Take the case of your corespondent's paper. In *principle*, no Court could hold that the Government was not entitled to the new found land: but suppose the *boundary* between the village and the Forest (where both were still unaltered) had never been properly defined or laid down, and there was some doubt about the real total area of the village estate, etc., it might be practically difficult to prove that the new land *was* on the site of the forest. A suit would certainly lie to recover the forest alluded to: it must be successful if the facts can be proved. In short, the rule of accretion may be stated thus:—

When the gradual accretion is really out of the river bed, it forms part of the estate to which it becomes attached, on the principle that the 'accessory follows the principal'; and as regards all rights and incidents of tenure. But when the accretion is not merely out of the river bed, but by way of recovery of a washed away property now slowly coming back again, the new land is (on proofs of the facts) not an accretion to the neighbouring estate, but (as decided in "*Lopez* versus *Muddun Thakoor*") belongs to the original owner.

B. H. B.-P.

OXFORD, *March, 1894.*

Utilization of the less valuable Trees.

Having read with much pleasure Sir D. Brandis' most interesting paper on the above subject in the February Number, I think a few words from me on the Madras aspect of the matter may not be out of place.

I am entirely in accord with Sir Dietrich. The importance of the subject impressed itself upon me strongly during the latter part of my service, presenting itself in every case in which protection became a reality. Its solution is by no means easy. It increases the more in difficulty when protection and the consequent growth are easy, complete and satisfactory. Unfavourable conditions of growth naturally reduce the problem to a minimum.

I am also convinced, like Sir Dietrich, that the solution of this and similar forest problems must be devised by Forest Officers themselves; and that they must not wait for orders of Government or any "higher authority," but work them out for themselves, initiating and fostering industries and sources of demand according to local circumstances.

Too much pains cannot, I think, be taken to impress this especially on the younger forest officers, who are naturally inclined to trust to Providence or the natural laws of supply and demand, and await instructions, instead of foreseeing and grappling with such questions themselves.

The influence of a professional journal like the *Forester*, and of such able papers as Sir Dietrich's, by attracting and directing the attention of Forest Officers to the consideration of such matters, ought to be productive of the best results. I should like to see a great many more such papers and suggestions from retired Forest Officers who have experience and leisure. Even if found Utopian or impossible for immediate adoption, such suggestions should lead to reflection and discussion, and might possibly be ultimately productive of beneficial results.

Turning to Sir Dietrich's suggestions for this utilization of the less valuable trees which embrace wood pavement, impregnated sleepers and telegraph poles, paper pulp, acetates, naptha, wood tar, charcoal, and iron; I am afraid that wood, however well impregnated, which must always be more or less a complicated and costly process, is never likely again to take the place of iron in a tropical country for railway sleepers and telegraph poles, and that the manufacture of acetates, naptha and tar is a little beyond the sphere of practical forestry in India at present, though doubtless deserving of attention at the hands of Forest Officers.

There remain charcoal and iron. As to charcoal, a good deal had been done and much remained to be done, when I left the Madras Presidency, in the direction of improving the process and

quality, and rendering larger supplies of a superior article available at reduced prices.

In several instances, the results were excellent, and enabled us to transport and dispose of wood which would otherwise have rotted in the Forest. But it must be borne in mind that the really superior, soft woods produce inferior charcoal—a fact of which our native friends are fully aware—and I am bound to say that good prices were only realised when the charcoal was made from the hard woods or bamboo. Still, as I have said above, a great deal can and should be done in this direction ; and I trust the day has passed in which a District Forest Officer, a German trained one too, with several years' experience, assured me that no charcoal was consumed in his District, a large one, merely because the seignorage returns under that head under the permit system were—*nil !* (*N. B.*—This is a fact !)

There is a very large and steady demand for wood charcoal in the Southern Districts, and, I believe, throughout the Madras Presidency ; and the sooner the wasteful, dangerous and, from every point of view, suicidal custom of granting permits to burn it within wide and indefinite areas on a low rate of seignorage is put a stop to and replaced by departmental operations under a proper system and supervision, the better for the forests, the revenue and the consumers.

As regards Iron—I have never been in accord with Sir Dietrich that the failure of the attempt at its manufacture under European process in the South Arcot and Malabar districts was due to scarcity, or high prices, of wood. I stated my reasons for disagreement in a memorandum on his valuable suggestions of 1883.

They were, and are, briefly, that ample supplies of wood of good quality were available, and granted in most cases free of all seignorage or royalty and in others at nominal rates, greatly to the detriment of the forests ; that at Porto Novo and Beypore the cheapest of all carriage, *viz.*, water, was available, whilst at Tiruvanamalai the forest surrounded the town and was intersected by good roads.

I found the cause of failure to be the impossibility of producing iron with wood fuel in quantity and quality to compete with that produced with coal and imported, and quoted my authorities. In the interest of the Department and of the utilization of the less valuable trees, I regret my conclusions, but must reluctantly adhere to them. With regard to the manufacture of iron by the native process, with gradual improvements the case is somewhat different, and I hope it is not too late for efforts in that direction to produce good results. I do not ascribe the decrease in the native iron industry in Madras to actual scarcity of wood or the rates charged for it and charcoal, which have rarely exceeded a seignorage of a few pie per head load if taken for sale, that for agricultural implements, or own use, being nominally at all events free. But there were, doubtless, restrictions and exactions on the part of the Forest subordinates, and we (myself amongst the

number) certainly regarded the iron smelters in past years as enemies and forest depredators, and did our best to suppress instead of encouraging their efforts under regulation. In addition to this, European iron, shaped almost ready for use, found its way into the markets at low prices, and was readily adopted. It was more brittle and less durable than the well-wrought iron produced by the native process, but it was cheaper, and could be procured without so much delay and trouble, at least in the Districts near the coast and on the lines of railway.

In more inland districts, the industry doubtless still survives, and certainly appeared to be flourishing in Bellary when Sir Dietrich visited that District with me in 1882. Whilst, therefore, not so sanguine as he is as to iron-making with charcoal offering "the most promising field for utilizing the surplus wood," I think it most desirable that efforts should be made to revive and foster the old native iron industry with improved appliances and necessary safeguards against waste and destruction of the forest growth.

I am, however, inclined to think that in the supply of wood fuel to the railways, factories, brick kilns, and sugar mills, we shall find a larger and more assured outlet for the less valuable and surplus wood than in the iron and other industries referred to by Sir Dietrich.

It has been customary in Madras for civil officers and others, taking a superficial view of the question, to decry the supply of firewood to the railways, which, it is urged, is denuding the country, for the sake of a temporary revenue, to the detriment of the climate and agriculture.

Under the old system of contractors, who felled as and where they liked, and in the absence of proper protection and regulation, there was doubtless much truth in this view, but with proper departmental action, under which the fellings are regulated and efficient protection subsequently ensured, the objections cease to have weight, and the railways burning wood should become the best friends of the forests and agriculturists, enabling us to conserve large areas for the growth of timber, whilst disposing of the small and inferior descriptions as firewood at prices which will more than cover the cost of conservancy and improvement. It cannot be too frequently repeated and borne in mind that, whilst the denudation of forest areas, however extensive, is, *in the absence of protection*, a mere question of time, comparatively small areas, *properly treated and protected*, will last and give a sustained and increasing field *for ever*. Every Forest Officer is, of course, conversant with this; but we do not always apply it practically, and are apt to grasp at the partial control of large areas instead of restricting and concentrating our attention on such as, with the means at our command, we can really protect and improve.

I well remember Sir Dietrich (then Mr.) Brandis impressing this on me in England years ago with regard to this Salem District,

and urging that reform and progress in Forest management in Madras, which was at the time languishing, must be brought about by individual efforts of Forest Officers who understood their profession producing examples of its application on however limited a scale.

I am afraid I did not take his advice so much to heart as I ought, but its truth was brought home to me when a young District Forest Officer, Mr. Porter, concentrated his attention for a time on what is known as the little Sholakarai Reserve in South Coimbatore, and in a short space of time transformed what had been a constant source of expenditure without any good results, into one of permanant income together with an improvement in the growth sufficient to convince the most sceptical of the advantages of rigid protection from fire and grazing and of properly regulated fellings.

Mr. Brasier in Tinnevelly and Mr. Marshall in North Arcot followed suit, and I am glad to see from extracts from Inspection Reports by Mr. Popert in the February number, that the former officer is initiating similar reforms in Salem.

This brings me to Sir Dietrich's remarks on the measure of protection afforded in that and other Districts of the Madras Presidency since his visit, and the passing of the Forest Act.

I regret to have to confirm the conclusions at which he has arrived from a perusal of the Annual Reports, that protection has been most inadequate and disappointing, and *therefore* we do not find the bulk, or indeed any given proportion of the so-called Reserved Forests, forming "dense compact masses of forest growth" as they ought to have done, and certainly would have done in greater or less degree had complete protection been secured and maintained even over comparatively small areas during the past ten years. My last inspections three years ago convinced me that in most of the Southern Districts at least, there was virtually no protection at all ; and in Salem and South Arcot the protection was even less than was the case 10 or 20 years before when the enclosed areas then styled "Fuel Reserves" were at least partially protected.

This lamentable state of things was doubtless partially due to the time of the District and Range Officers being much occupied with Forest settlement and demarcation, which have presented many more difficulties and delays than originally contemplated, to the paucity of protective establishments, to changes of District Forest Officers and Collectors, to divergences of opinion, to a vacillating policy on the part of the Board of Revenue (the "Controlling Authority") and of Government ; and last, but by no means least, to want of knowledge and zeal, and loss of interest in their work on the part of some, at least, of the District and Range Officers, and to the absence of one professional Head of Department with power to prescribe and enforce continuity of action, encourage the willing, and spur the lazy or supine.

I do not wish to trench on controversial topics connected with the organization and administration of the Department in Madras. Suffice it that, in my humble opinion, there are too many masters, too much centralization in a non-professional Board, and too much non-professional interference all round which irritates and disgusts a sensitive and zealous Forest officer who knows how things should be managed, and affords a screen to the thick-skinned, lazy and ignorant who are fortunately in the minority, in the controlling grades, at all events.

I trust things have mended, and may continue to mend, although my recent advices from Madras are not encouraging.

Anyhow, I would strongly commend Sir Dietrich's advice and hints to Forest officers in Madras and elsewhere.

Reading between the lines they amount to much the same as he gave me years ago. Stick to your professional work, protect and improve 100 acres if you are not allowed to close 1,000, don't write or argue, accept and obey orders cheerfully, but *with discretion* (!) ; trusting to the whirligig of time to bring things straight and the results of your work to speak for themselves, and prove your best reward, and never cease in your endeavours to secure and maintain the highest possible yield of the description of forest produce you wish or are ordered to grow, and to ascertain and develop the best markets for it.

If our District and Range Officers adhere to something like the above principles, and the Conservators support and encourage them, and do their best to secure continuity of action and a steady policy on the part of the Board of Revenue and the Government, I do not despair of the adequate protection of sufficient areas being secured, even under the present somewhat complex system of administration in Madras, to an extent which will render the question of the utilization of the less valuable trees urgent. More especially am I convinced that protection alone will not suffice to regenerate the "jungles" in which the trees have been hacked about and browsed over, but that it must be accompanied by "improvement fellings" varying in accordance with circumstances, but all yielding considerable quantities of wood chiefly inferior both as regards description and growth, on the profitable utilization or disposal of which progress will, from financial reasons, greatly depend.

It may not be out of place to state, in conclusion, that the yield of the Blue gum plantations on the Nilgiris has, as Mr. Gamble is aware, exceeded Sir Dietrich's estimates, being nearer 10 tons per acre per annum than 6, but they have not been extended, as there is not sufficient demand even for the annual *coupes*, owing to the existence of extensive private plantations of the same tree. The Nilgiri railway must now be approaching completion, but I do not anticipate much increase in demand from it, either as a consumer or carrier, the rapid growth and large proportion of water in the

Eucalyptus wood rendering it unsuitable for engine fuel, and the cost of carriage to the plains by rail being, I fear, prohibitive.

The yield from the Casuarina plantations in the plains has also proved fully up to Sir Dietrich's estimates, but they have sustained much damage from irrational treatment in order to secure an immediate revenue, storms, and exceptionally dry seasons.

In the case of the Casuarina, the demand is secured, but private enterprise has rendered it almost, if not altogether, unnecessary for Government to extend its planting operations On the whole, I am of opinion that the efforts of the Department are best directed to the conservancy and improvement of the natural forests and "jungles" in order to produce and secure a sustained yield of timber and firewood sufficient not only for present but for future requirements, as well as adequate supplies of grazing fodder and thatching grass, leaves for manure, and other minor produce.

Notwithstanding this somewhat lengthy paper, I feel that I have by no means exhausted the subject, but if my writing leads to consideration and discussion, it will, I think, not be wasted.

NAVAL AND MILITARY CLUB, *30th March 1894.* } I. CAMPBELL-WALKER.

Damage done to Himalayan pines by Loranthaceous parasites.

During his travels in Kashmir in the last few years, Mr. J. F. Duthie, Director of the Botanical Department, Northern India, found again a minute parasitic plant, which he had originally discovered in Kumaon in 1884, and which Mr. J. L. Lace afterwards collected in Kunawar This plant, the *Arceuthobium minutissimum*, was growing on the stems of the Blue Pine (*Pinus excelsa*), and doing them considerable damage. It is probably the smallest flowering plant known, and has the appearance on the bark rather of a moss than of the plants of the family to which it belongs, that of the *Loranthaceæ*, of which the mistletoe is the best known member. Recent enquiries made in the Forest Department by the Inspector-General of Forests brought out the opinions that the mistletoes were certainly uncommon plants on the Himalayan pines, but it is probable that the writers did not quite sufficiently realize that it was the minute *Arceuthobium* that had led to the enquiries and not the comparatively large species of *Viscum* and *Loranthus*. We recommend such of our readers as have the opportunity, to look for the *Arceuthobium* on Blue Pine trees, and ascertain in what the damage it does consists. Those, too, who have the opportunity, whether in the hills or in the plains, should investigate the common species of *Loranthus* and *Viscum*, for it is undoubted that they do considerable damage in some places, and enquiry might lead to means of protection

Albizzia Lophantha as a 'reboisement' plant.

We have received enquiries, asking us, for the information of Baron von Mueller of Melbourne, what it is that is being done with the large quantities of seed of *Albizzia lophantha*, which have been collected every year in Australia and sent to the Punjab for Forest Department purposes. All we have been able to ascertain is that it has been tried in the re-stocking of barren hill sides at 2,000 to 3,000 feet elevation in the Jhelum Salt Range and the Pabbi Hills, where the summer and winter extremes of vegetation may be taken as 170° in the sun and 115° in the shade on the one hand, and 32° and 40° on the other. What has been the result is what Baron von Mueller wishes to know; and we confess also to some curiosity ourselves. Will some Forest Officer in the Punjab kindly tell us all about it—how the plantations were made, whether by direct sowings or by nursery transplants—what has been the result—why was the *Albizzia lophantha* (which by the way is not a timber tree at all) chosen—and what are its peculiarities which render it useful as a 'reboisement' plant?

We have seen the plant frequently in the Nilgiris, where it is not uncommon in the undergrowth in Aramby, Tudor Hall, the Government Gardens and elsewhere: it was a straggling, soft-wooded, wattle-like plant with pretty spikes of pale yellow flowers, but it did not seem to be particularly noticeable as likely to thrive in such a climate as that above described.

II-CORRESPONDENCE.

Revolution in Systematic fire Protection of Forests.

SIR,

While reading over one of the Central Provinces Annual Provincial Forest Reports for the year 1892-93, one paragraph in it, out of many interesting ones, struck me as being especially so, and that was the additions made to systematic fire protection. It is stated by one of the Conservators that a very large area, some thousands of acres, was added during the year at "no expenditure." This is very creditable; and I am sure all our congratulations are due to the Conservator for this change in systematic fire protection at "no expenditure." Naturally, this has called forth, at the expense of a less fortunate Conservator, the expression of "Well done, thou good and faithful servant," &c. &c., this we do not grudge. But now let's consider a bit. The conditions for fire protection in the Province are not favourable; and at times most difficult to manage

without the outlay of a large expenditure. Then how came this fortunate result? Through the agency of the regular protection establishment? Ye gods! What an exemplary establishment to work with! No fire lines, no extra establishment, but only a "hukum" to the forest guard to protect the 10, 20, 30 and even 40 square miles under him: which is the case in the province, and he does so. With modesty the Conservator remarks that the year was an exceptionally favourable one for fire protection, and that these results of "no expenditure" need not be looked for every year. Good, but let's proceed. Further down the Report another tabular statement is given, which discloses facts still more wonderful, but into the history of which we have no insight. About 80 per cent. of the rest of the forests, not systematically protected from fire, did not burn. Who helped to protect these—if not the regular protective establishment? Perhaps the "Kotwar" of the villages? Or it might have been that circulars were posted up on trees which awed the "mowah" gatherers, the "dyah" cultivator, and general traveller into the importance of the "Sarkar's" printed chits.

Judging from the continual cry of the great want of executive and protective establishment in this Province—which want nobody denies, considering that there is an area of some 19,000 square miles of Government forest in it, it appears that the statement showing the very large area of forest as added to systematic fire protection in the Circle during the year, is most highly coloured. Equally coloured results may have been made to the systematic fire protection of the other Circle, and with perhaps better results, but such has not been the case, and so the less fortunate Conservator has had to forego his crumb of praise. No doubt he would have made it up in his next Annual Report, but, alas! as he now says:—"Man proposes, God disposes." He leaves the Province shortly, never to return to his happy hunting grounds. There are other points in the Report which require to be taken up, and no doubt these will be reviewed by abler hands. And that we shall soon see the review of the Report in the pages of the "Indian Forester," I have no doubt.

CAMP, *8th April*, 1894. JO HUKAM.

The Grading of Rangers.

DEAR SIR,

Does not the Forest Department Code, provide that, *cæteris paribus*, Rangers should be graded on Provincial Lists according to seniority of service?

As I read the Code, promotion should be regulated in this way, and if this is the correct reading, the Burma and some other Provincial Lists recently published show a want of conformity to the Code.

In the Burma List of Rangers for 1st January 1894 even a passed student of Dehra Dun with Ranger's certificate is superseded by (among others) an uncertificated Ranger of 4½ years less service as a Ranger and 8 years less service in the Department.

To take an opposite case: a Ranger of 3¼ years' service and 1⅔ years as a Ranger, who in the 1893 List was a probationer in the 6th grade, has during the year been promoted to the 4th grade, jumping the 5th grade and superseding several men senior both in service as Rangers and Forest Officers, among them (to take the extreme case) a Ranger of 10 years' service, of which 6 years have been in the Rangers' class.

The reason for the above mentioned cases is that the sanctioned appointments are distributed in a fixed manner to the different Forest Divisions in the Province, and promotion is practically restricted in each Division to the allotted Rangerships. Transfers of Rangers from one Division to another are very exceptional and as a rule not at all desirable, it thus happens that Rangers serving in Divisions to which higher grade Rangerships have not been allotted find their promotion blocked and themselves superseded by junior men for no fault of their own.

Were promotion regulated Provincially, this would not occur. No doubt few Rangers study the Classified Lists, or we should hear some expression of dissatisfaction from them. The injustice exists none the less,

PYINMANA: *18th April 1894.* C. E. MURIEL.

III.—OFFICIAL PAPERS, & INTELLIGENCE.

Notes on Forest Tram lines and Wire tramway in Germany and Switzerland, by H L. Porter.

Hohwald Railways, Vosges.—In the vicinity of the Hohwald there are three forest railways, *viz.*, one at Welshbruch, one at St. Blaise, and the third at Schorinech. The latter was not visited, as it is similar to the one at St. Blaise. These railways are exceedingly interesting, as the question of forest railways is at present attracting much attention in India, and especially in the Madras Presidency, where more progress has been made than in other parts of India.

The Welshbruch Railway was constructed by the town of Ban, and four other communes, and runs through thick forests. Its length is 11,000 metres (about 7 miles), gauge 1 metre, weight of rails per metre 12 kilogrammes (about 26 lbs.) minimum radius of curves 25 metres, maximum gradient 7·6 per cent., mean gradient 5 per cent From the forest to the terminus outside, there is a down gradient the whole way. The empty trucks are pulled up by horses, the loaded trucks run down of themselves, and require a brakesman for each truck. The peculiarity about this line is that the wheels are provided with a double flange to prevent derailments; this is a very clumsy arrangement. The line is said to pay 10 per cent. on the capital outlay. Personally, I do not see how such a line can pay. The principal expense in timber transport is the cost of loading and unloading. When once a cart or truck is loaded it does not cost more to move a log three miles than it does two. The terminus just outside the forest is about two miles from the Ban Railway station. Did the tramway run to the railway station, nothing could be said against it, but no figures will convince me that loading timber on the forest railway trucks one mile from the terminus, unloading at the terminus, reloading in carts and then carting to the railway costs less than carting the whole way. The profits must be more than swallowed up by the two miles of road from the terminus to Ban. To extend the forest railway to Ban, it would be necessary to take up vineyard land, and this would be too costly.

The second tramway inspected was at St. Blaise a few miles from Rothau. Its length is about 13½ kilometres (8½ miles), gauge 70 centimetres (2 feet 4 inches), weight of rails 16 kilogrammes (35 lbs.) per metre, maximum gradient 7·6 per cent, mean gradient 5 per cent., total cost 100,000 marks (£5,000), and this includes an engine of 50 horse-power and 30 trucks (15 doubles). The minimum radius of the curves is 20 metres. This railway was constructed to work a block of forest of 70 hectares, in which all the trees (silver fir) had been blown down during a gale It was necessary therefore to remove them at once, otherwise they would have become valueless, had they had been left out in the open for any length of time. This line almost throughout its entire length runs along the side of the main road, and crosses it in several places, for it is not uncommon in Elsass and also in Switzerland for railways to run along the road. This saves the cost of taking up land, and no one seems to consider it a dangerous practice. The line has only recently been laid by Forstmeister Bieran, who has taken up forest railways as a study, and has been relieved of his ordinary duties. The work throughout is excellent, and there have been no accidents in spite of the sharp curves and steep gradients. Steam is the motive power. Each truck is provided with a powerful brake, invented by M. Bieran, who promised to send me the plans, but up to date has not done so. The

terminus of this forest railway is the St. Blaise railway station. This block of 70 hectares contains 20,000 cubic metres of timber, and it is estimated that by using the railway over 2½ marks per cubic metre will be saved. Not far from Rothan is the Schorinech forest railway similar is almost every respect to the one at St. Blaise.

Forest railway, Zurich.—The forest railways used in the Schwald forests near Zurich are less modern that those in Elsass. The gauge is two feet, the rails which are of all sorts and kinds appear to be about 14lb. to the yard, the trucks and brake arrangements are decidedly primitive, and the permanent way roughly laid down. A railway of this description costs little, as most of the material was purchased second-hand; it doubtless serves the purpose for which it was constructed, *viz.*, for carrying fuel and small pieces of wood, but it would not do for heavy timber. The Schwald forests belong to the town of Zurich, and M. Meislis, the Forest officer in charge, has to turn everything to account to make revenue: he has established workshops just outside the forest, close to the Schwald railway station; here poles are impregnated with sulphate of copper, and billets converted into axe handles, wood wool, and small bundles of firewood. Apart from the question of interfering with trade, and in spite of figures to the contrary, I feel convinced that it would pay better to sell the wood in the rough. Figures are very misleading as they can be made to prove anything.

In the Hohwald forests of Elsass, and elsewhere in Germany and Switzerland, sledges are much used on the hills for bringing down timber and fuel. The best gradient for the sledge roads, so the workmen informed me, was 7 to 8 per cent., it should never exceed 12 per cent., as the sledges become unmanageable. It is surprising what heavy loads can be brought down. I saw sledges piled up to a height of ten feet with billets, and containing from 2½ to 3 cubic metres being brought down by one man. Accidents do occur occasionally through the sledges becoming unmanageable, but this is not often the case.

In the vicinity of Bellinzona in Switzerland (on the St. Gothard railway) wire cables are largely used for bringing down fuel and small timber from the mountains. Regarding the cost, &c., of these, it is most difficult to obtain information, as they are without exception the property of the merchants, who purchase the wood standing from the communes and private owners; there are no Government forests in the neighbourhood. I inspected several cables, which were being worked. Of these the most modern and consequently the most perfect, was one at Arnedo, about half an hour's walk from Bellinzona. The total height is 2,850 metres, cost 10,000 francs (of this sum 1,800 was spent in putting it up), average gradient 28 to 30 per cent., number of supports 11, area of forest purchased 1,500 hectares, time allowed for removal 5 years, estimated amount of produce 15,000,000

kilogrammes, amount paid for the block 35,000 francs. The above information was supplied to me by the merchant who owned the cable. The circumference of the cable, which carried the produce was two inches, and that of the brake wire 1¼ inches. The altitude at the top, as measured with a pocket aneroid, was 4,075 feet and at the bottom 1,900 feet. The system is almost identical with that described by Colonel Campbell-Walker, as existing in former years near Lucerne. It consists of two parallel stationary cables to carry the produce, and of a continuous moveable cable running round a drum at the top and at the bottom; this latter is fixed to the loads and controls them, being itself controlled by powerful brakes acting on the drums at either end. By this means the loads can be stopped at will, and it not only controls the loads coming down, but also pulls back the wheels and hooks, which bring down the produce. The loads are brought to the top station, by means of radiating auxiliary cables, leading from different parts of the block; these auxiliary cables are simple wires, and are worked without any brake arrangement; the loads rush down them at a terrific pace, and are brought up against a thick bank of earth. At Roveredo, some distance from Bellinzona, another cable was inspected; this unfortunately was not being worked.

Timber slides or slips with a semicircular section made of round poles nailed together and wooden troughs made of planks, were inspected at Schwald, the former are used for bringing down poles, and the latter (gradient sometimes 1 in 1) for billets.

The conclusion arrived at by me with regard to forest railways on the continent is that they do pay under certain circumstances; the conditions which obtain at St. Blaise are distinctly favorable, here we have the case of a fully-stocked forest containing only ripe trees; these have all been blown down by the wind, and in order to realize anything, they must be removed at once, it would be impossible to do this with carts, as sufficient carts were not available. In our Madras forests, with few exceptions (in plantations and perhaps on the Anaimalais) forest railways will not pay, as the forests are so poorly stocked. If a railway for the removal of timber is required, the rails should be fairly heavy and certainly not less than 25 or 30 lbs. Toy tramways with rails of 14 lbs. and under should not be used, this has been found out by experience on the Anaimalais. Another important point is that the line should be well laid and ballasted. Wooden sleepers are the best to use; and it is a mistake to suppose that light rails (*e.g.*, 14 lbs.) laid down anyhow will serve the purpose, they won't, and constant derailments will be the result, not to mention the bending and contorting of the rails. Good brakes on *each* truck are a necessity; those invented by M. Bieran cannot be improved upon; the side lever brakes supplied by Messrs. Fowler and Co. are not sufficiently powerful; further they are continually getting out of order, and the levers bend or break; the special brake vans supplied for the

Anaimalai tramway were a complete failure In any case, special brake vans are a mistake, as they are quite unnecessary, and an extra expense has to be incurred in moving them about the line. The minimum radius of curves should not be less than 20 yards, and the rails should be bent as required ; it is a great mistake to get set curves from the makers ; they are too sharp ; a single truck may get round them without derailing, but double trucks will not, unless a third or guard rail be used.

Wire cables can be used for crossing deep valleys and for bringing forest produce down steep hill sides ; this would of course be allowable under certain circumstances, but in the neighbourhood of Bellinzona the hills are becoming rapidly denuded, as it would not pay to put up a cable to a block of forest, unless it was to be practically clean felled. Avalanches and torrents are the result, the Swiss Government looks on while the hills are being denuded and their attempts to repair the damage done by re-afforesting practically at its own expense ; as the owners, so the forest-officers informed me, often refused to re-afforest when the Government offered to bear as much as 90 per cent. of the cost ; in this free country it is apparently impossible to acquire such lands as being required for a public purpose. These precipitous hills, which are becoming rapidly denuded, remind one of many hills in the Madras Presidency where the denudation is due to the same causes by overworking and cattle-grazing. As a general rule, it is advisable to leave alone forests growing on hill sides, which are too precipitous for roads, the revenue to be derived is small in comparison with the irreparable damage done ; far better to treat them as forests of protection, and exclude religiously cattle and cutting instruments. If large quantities of heavy timber have to be brought down steep hill slides from plateau or tablelands, a railway with a self-acting incline is preferable in every way to wire cables or slides. For removing trees to the road, there is nothing better than the Indian elephants ; I saw several kinds of screw jacks and levers in use, but the process was slow and costly. Sledge roads could, I consider, be used advantageously in many of our Madras forests.—(*From a Report to the Madras Board of Revenue.*)

Rules for the Training of Junior Assistant Conservators of Forests in Madras.

The following rules, recently put in force in Madras, may be read with some interest in other Provinces by Junior Assistants who are not quite so carefully nursed. We suspect that Divisional Forest Officers in Madras will hardly look with unmixed delight on the appointments of young Assistants to their Divisions. If they really carry out the rules, their lives will be more or less a burden to them.

As the Board regards it as of great importance that Junior Assistant Conservators of Forests should be properly and systematically trained during the initial period of their service, especially in regard to knowledge of the vernacular, accounts and office procedure, it resolves to issue the following instructions, which have been compiled, after obtaining the views of the Conservators of Forests, on the employment of an Assistant Conservator during the first 12 months of his career.

2. For the *first three months*, the Assistant's duty should be—

(*a*) Study of the district vernacular, Forest Law, Forest Code, the other Acts and Revenue Standing Orders in which he has to pass (*vide* paragraphs 40 and 41 of the Forest Code), and such other important orders of the Board and Government as the District Forest-officer may from time to time prescribe.

(*b*) General study and practice of office work.

(*c*) Charge for one month of the correspondence work of the District Forest-office. During this period, the Assistant should be required to dispose of all matters coming up, and submit his disposals for the District Forest-officer's approval, the District Forest-officer pointing out to the Assistant the reason of any corrections or alterations made by him in the latter's drafts.

(*d*) Short tours in company with the District Forest-officer, to be selected as far as possible with reference to the following instructions :—

(i) The object of the tour should be to give the Assistant an idea of the flora of the district and the general conduct of field work.

(ii) Each tour should be made with some specific object, and not merely for general inspection, unless the Assistant should be called on to accompany the Conservator (*vide* paragraph 8 below).

NOTE.—During these tours with the District Forest-officer, the Assistant's practical knowledge of surveying and levelling should be tested and improved.

3. For the *second three months*—

(*a*) Study of the vernacular, Forest Law, &c., as detailed in the preceding paragraph. During these three months the Assistant should also submit, along with each weekly diary (paragraph 6 *infra*), three vernacular *takeeds* written by him.

(*b*) Charge for one month of the accounts of the District Forest-office. During this month, the Assistant should be required to keep the cash book in his own hand-writing, frame and check all estimates, examine all vouchers, and see that sanction (wherever necessary) has been obtained, or that work is not being done in excess of sanctioned estimates.

(*c*) Preparation during the three months of all returns due to the Accountant-General, the Conservator and the Board.

(*d*) Touring as per instructions given in the preceding paragraph.

NOTE.—It should, however, be clearly understood that an Assistant Conservator should not be deputed for any one special work, such as the constructions of a bridge, &c., during the first six months of his career.

4. During the *third three months*, the Assistant's course should be—

(*a*) Study of vernacular, &c., as above. During these three months, the Assistant will submit with each weekly diary six vernacular *takeeds* written by him.

(*b*) To assist the District Forest-officer in the preparation of the annual budget estimates and administration report and in framing and checking the returns necessary in connection therewith.

(*c*) Touring as above.

5. For the *fourth three months*, the Assistant should be placed in charge of a range, it being now left to him to follow up for himself his studies in the vernacular, &c.

6. During the whole of his first year, the Assistant should submit weekly diaries showing in detail the work he is engaged upon to the Conservator through the District Forest-officer and the Collector, who will forward them with such remarks as may seem called for. From these the Conservator will be able to judge whether the Assistant is making good use of his time and whether the direction of the course of his training is as it should be. While the Assistant is at head-quarters, he should daily attend the District Forest-office and record in his diary his hours of attendance, the work done and the subjects studied.

7. Half yearly reports on the Assistant Conservator's work and conduct should be submitted by the Collector to the Board through the Conservator.

8. The Conservator may, for special reasons, vary the course of training prescribed above in the case of any Assistant Conservator under training in his circle; but such variations and the reasons therefore should be stated in the half-yearly reports to the Board. When the Conservator inspects the district during the first year's training of an Assistant, he will exercise his discretion as to taking the Assistant with him during the whole or a part of his tour.

9. After the expiration of his first year, the Assistant should be kept on in charge of a range till the Collector and the Conservator consider him fit to hold a sub-divisional charge. It will now be sufficient to require from him the same Diaries as would be submitted by an ordinary Range or Sub-Divisional officer; but the half-yearly reports to the Board should continue until the Assistant has passed the examinations necessary for his promotion to the 1st grade, or is put in charge of a district.

10. The above instructions will, with the approval of Government, be embodied in the new edition of the Forest Code.

IV.—REVIEWS.

Le traitement des bois en France.

No one has had better opportunities than Charles Broilli, and for becoming thoroughly acquainted with the French forests-and he has given some of the results of his long and varied experience in a very attractive form in the book before us. Broilliard left Nancy in 1853, and after spending 6 years as Garde Général in the silver fir and oak forests near Besançon, he became Professor at Nancy in 1859, and for 22 years, during the long summer tours of the Nancy students, he visited annually the fine oak and beech Forests of the north of France and the silver fir, spruce and Scotch pine forests of the Vosges and Jura mountains. From 1881 to 1891 he was successively Conservator of Forests at Macon and at Dijon, and since 1891, when he retired from the public service, he has been Editor of the *Revue des Eaux et Forêts.* He has visited all the most interesting French forests in the Alps and between the Vosges and the Pyrenees, as well as those of Switzerland, Great Britain and Roumania, and has become acquainted with nearly every one in France who has taken much interest in forestry, as is shewn by the long list, which he gives in the preface of the present book, of the friends who have assisted him in its compilation.

Foresters in India, South Africa and Australia, who studied under Broilliard at Nancy between 1867-1881 will be glad to read the results of the long and varied experience of their esteemed master.

The silvicultural facts recorded in the book are based on the observation, comparison and study of the phenomena which forest growth presents under varying circumstances, but the Forester is warned not to lose himself in details which might be of importance in gardening. We are also warned not to plunge too deeply into the mathematical theories of forestry, which are now so prevalent in Germany, especially as regards the results of the experimental plots, (*stations de recherches*) Their danger, Broilliard imagines, lie in the impossibility of foreseeing the future of a wood from its past history; and that in making thinnings one must be guided by the nature of the soil, climate, species and even of the individual tree, and cannot base one's practice on tables made for the average of woods spread over large areas. There can be no doubt, however, that in Germany the uniformity of extensive areas of pure spruce,

or Scotch pine forests is more susceptible of rigid mathematical calculation than the oak and beech Forests of France.

In spite of this dislike for mathematical formulæ as applied to forests, Broillard has explained clearly enough the methods of estimating forests, and of calculating the rate of interest which they produce on capital under different rotations, and he has in this edition introduced for the first time a chapter on the division of a forest among the heirs of a private owner, a matter of considerable importance in France, but one which, Broilliard considers, had better be left undone, as the larger the area of a forest, the more cheaply and efficiently can it be managed.

Another novelty is that he has given up the working of High Forests according to the volume of timber to be cut annually, and proposes to work them by area as in coppice woods. Where the soil is fairly uniform and seed years frequent and regular, such a method may be followed with advantage, and nothing can be simpler than his tables of fellings for an area of 500 acres of oak and beech Forest, with a rotation of 125 years and subdivided into 125 four-acre compartments. He assumes that a mature compartment might contain 128 mature oaks and beech, or hornbeam, the more oaks the better, but with a beech and hornbeam underwood to protect the soil, and prevent the formation of epicormic branches on the large oak trees.

In order to make the seeding felling, he would remove 32 of the oaks selecting the worst of them, or a proportionately larger number of trees if there were a mixture of large beech, when all large crowned beech should be first felled, and all the low crowned hornbeam. At the same time, the underwood should all be cleared away, and the soil partially hoed, if there were a crop of acorns on the trees.

Five years afterwards, he would cut about 24 of the oaks, again selecting the worst, and at this felling, most of the remaining beech or hornbeam beech standards would probably be felled. After another five years 18 oaks would go, and 14 more after another interval of 5 years, thus in 15 years' time only 40 oaks would be left on the 4 acres, or 10 per acre, and these the best of the original trees ; and they would be by this time surrounded by a thicket of oak, beech, and hornbeam seedlings, with a mixture of softwoods, such as birch, sallow, wild cherry, &c. He would not fix any definite time for felling these 40 oak standards, but would gradually remove them in the subsequent thinnings as they showed signs of falling off, or when they had attained such dimensions as no longer to repay the proprietor for the sacrifice of capital which he would make in leaving them.

At every one of these successive reproduction fellings, the greatest care would be taken to protect the oak seedlings from the invasive beech or soft woods which might spring up, but regular thinnings would not commence till twenty-five years after the first seeding felling.

The table of fellings for the whole wood of 500 acres would therefore run as follows :—

PRINCIPAL FELLINGS.

Number of Compt	Area in acres.	Seeding felling.	Secondary fellings.			Final felling.
			1	2	3	
1	4	1894	1899	1904	1909	? One-fourth of the standing trees to be felled at each felling, except the last, the date of which is undetermined.
2	...	1895	1900	1905	1910	?
3	...	1896	1901	1906	1911	?
23	...	1916	1921	1926	1931	?
24	...	1917	1922	1927	1932	?
25	...	1918	1923	1928	1933	?
Total	100	...	...	...	...	

THINNINGS.

Compts.	Area in acres.					
26—35	40	1894	&	every	10 years.	Great care should be taken to protect oak saplings from beech and other species.
36—45	40	1895	&	„	Ditto	
46—55	40	1896	&	„	Ditto	
56—65	40	1897	&	„	Ditto	
66—75	40	1898	&	„	Ditto	
76—85	40	1899	&	„	Ditto	
86—95	40	1900	&	„	Ditto	
96–105	40	1901	&	„	Ditto	
106–115	40	1902	&	„	Ditto	
116–125	40	1903	&	„	Ditto	
Total	400					

Broilliard does not wish to obtain a dense growth of oak seedlings, and prefers a few here and there amongst the beech and soft wood , but in case oak should not spring up sufficiently, about 100 oak transplants should be planted in per acre after any of the fellings.

Many interesting extracts could be made from this excellent work which for a long time to come will be the Forest Manual of the French private forest-owner, but the space available in the *Indian Forester* must be considered, and its subscribers are strongly recommended to read Broilliard's book for themselves.

W. R. FISHER.

The Annual Forest Administration Report for Madras for 1892-93.

The most noticeable feature of the Volume before us is undoubtedly the last paragraph of the Government Order, one which will not only be read with amazement by Forest Officers, but has already attracted the attention of the outside public, to judge by an article upon it, which has recently appeared in the *Madras Mail.* The following is the paragraph to which we allude, in which the Government of Madras summarize the results of the year :—

"In conclusion, His Excellency the Governor in Council 'desires to place on record his thorough appreciation of the excel-'lent arrangements made by Mr. Arundel, the Commissioner now 'in charge of the Forest Department, for the general supervision 'of his subordinates and for the control of their operations. It is 'observed that Mr. Arundel was able to make tours of inspection 'through ten districts during the period under review, and others 'have since then been visited. The Forest Commissioner holds in 'this Presidency a position analogous to that of the Inspector-'General of Forests in Provinces directly under the Supreme 'Government, and it is most desirable that the administration of 'the department should be largely influenced by his personal con-'trol. The present report affords ample evidence of the fact that 'Mr. Arundel is fully conscious of this important principle, and 'His Excellency in Council observes with satisfaction that syste-'matic arrangements have been made to give effect thereto. The 'orders issued to Conservators and District Forest Officers in 'regard to the regular inspection of the forests under their charge 'form one instance in point, and it is further noted that periodical 'returns are now required of the progress of many operations 'which in former years have been carried on without any fixed 'system. The work of the department is doubtless hampered to 'a great extent by the insufficiency of the present subordinate staff, 'and there is reason to believe that much revenue is annually

'sacrificed on this account. The Right Honorable the Secretary 'of State has for the present postponed his sanction to the pro-'posals made by this Government for an increase to the establish-'ment, and the matter is still under consideration ; but His Ex-'cellency in Council trusts that the scheme elaborated in 1891 'may before long be approved, and the administration of the 'forests be thereby placed upon an efficient basis."

It is sad to find that there is not a single word of encouragement to Conservators or Divisional or Range Officers ; not a trace of sympathy with the hardship of the drudgery they have to go through ; and yet, if we are not mistaken, the Commissioner, Mr. Arundel himself, would be the first to deprecate a Review which, to use a common expression, gives him all 'the halfpence' for the year's work, and leaves the 'kicks' for the Forest Officers. Who can expect that the officers of a Technical Department of the Government, specially trained in special schools to administer estates which require special knowledge and special treatment, can work with the energy and enthusiasm for which Forest Officers have usually been known, if their efforts are to receive no better acknowledgement than this; and if that little praise which most Governments in India find it well to give yearly to those who have best borne the burden and heat of the work, is withheld from them, and given only to the non-professional outsider who is ignorant himself of the technical side of the departmental business. What would be said, if such a thing occurred in the case of a powerful Department like the Public Works? They, too, no doubt, have a non-professional head with the Supreme Government, but the Local Departments are at any rate administered by their own men who are professional Engineers, but we suppose that while Civilians who wished to interfere with, and teach their business to professional Engineers, would be justly laughed at, anybody is considered fit to supervise *Forest* works. Sir Dietrich Brandis pointed out in our pages, in January, what a small outturn of professional forest work there had been in Madras ; and the Government of India itself has, if we mistake not, noticed the delay in the preparation of Working Plans, and how, though much had been done in some directions, nothing at all had been done in others. It is now easy enough to understand why : the professional work is clearly becoming quite a subordinate matter, and the efforts of Forest Officers are being directed chiefly to the making of revenue at all costs ; and the compilation of records to give honour and glory to a member of a Board of Revenue.

The idea, too, that the Commissioner is in " a position 'analogous to that of the Inspector-General of Forests in the Pro-'vinces directly under the Supreme Government," shows that the Madras Government have but a very imperfect notion of what our Inspector-General's functions really are. The Indian Forest Code describes him as corresponding with Conservators on "profession-'al subjects, including the preparation of Working Plans and

'other matters which do not involve questions of administrative or 'general policy," and otherwise as "assisting the Government of 'India in dealing with the Forest business which comes before it." How about Working Plans? Can Mr. Arundel (we say it with all respect for one who probably is as good an officer as any in his service for the position) say that he is capable of doing in respect to them what the Inspector-General has every day to do? Of course he cannot, and this one matter alone shows the failure of the system which the Madras Government so strongly praises, and how impossible it will be for Forest work in Madras to reach the condition it is in in Europe or in some of the Provinces of India, unless a radical change is made and Forest Officers are released from the incubus which now weighs upon them, and allowed some freedom in bringing their professional knowledge to bear upon their charges and getting the forests they manage into the best condition for supplying the wants of the country. And as regards inspections: has it ever occurred to the gentlemen who sit in their Secretariat Offices and write about the work of others, that inspections may often be carried just a little too far? The unfortunate District Forest Officer of Madras, with a huge unwieldy charge, must have a bad time of it indeed, when he has to carry on his own work and make his perfunctory tours, and be responsible for the details of management, and, as if that was not enough, to spend months on tour under inspection by the Collector and the Conservator and the Commissioner, to say nothing of the occasional tours of the Governor himself. What with inspecting officers constantly about, and written reports called for on every wretched little point in which one of them can find a mare's-nest, it is not surprising that he has not much heart for Working Plans, and it will be no wonder if he degenerates into a sort of machine anxious only to manage to go though his service with a maximum of pay and a minimum of worry. Our remarks may seem strong, but we are convinced that they are fair; and indeed we may now turn to the *Madras Mail* and see if the remarks which that well-known authority has to make are not even stronger than our's. The *Madras Mail* writes:—

"Prior to 1892 each Conservator submitted the report for his 'own Circle. Since that date the Board of Revenue has compiled 'the annual report from the reports of District Forest Officers, re-'ceived through Collectors and Conservators, and the latter are only 'called on to submit notes dealing with technical subjects, *viz.*, 'natural and artificial reproduction and exotics. The report 'itself and the Government Orders thereon, show clearly that both 'the Board and Government are anxious to prove that the ad-'ministration of the Department by the Forest Member of the 'Board of Revenue is an unqualified success. This is very 'necessary, for it is no secret that the system finds little favour 'with the Secretary of State, the Government of India, or the 'Forest Officers themselves."

"The Forest Member is certainly to be congratulated on his touring. If his tours were not confined to the headquarter stations, the inspection of ten districts was certainly a remarkable achievement. The same cannot be said of his office work, which evidently got into arrears during his absence on tour, for we observe that "the revision of the rules under Section 26 of the Forest Act engaged the attention of the Board during the period under report." This is not the first year that the rules under Section 26 have engaged the attention of the Board; and they have not yet appeared. It would be interesting to know whether plans of operation, estimates, and such like matters, which have to be referred to the Board for sanction, receive the same amount of attention If they do, we are not surprised at Forest Officers grumbling at the delays which occur. In fact, the length of time taken in disposing of the most ordinary matters, constitutes not the least of the defects of the Board's administration.

'This is the first year that the Board's Forest Member has assumed the *rôle* of Inspector-General of Forests to the Government of Madras, and we wish him every success. But we fail to see the analogy referred to by Government, between the position occupied by the Inspector-General of Forests to the Government of India, and that occupied by the Board's Forest Member. Both, it is true, are the respective heads of their Departments; but while the former is a trained Forest Officer, and consequently able to give the Government advice on the management of its forests, the latter is a Civilian without any forest training, and to make matters worse he holds the appointment for one or two years at the most. His knowledge of the administration of the Department must therefore necessarily be as limited as his knowledge of scientific or practical forestry. The report may, as Government says, afford ample evidence of the personal control exercised by the Forest Member. If it does, it seems a pity that this, his first attempt, should have met with so little success. A fall of revenue from Rs. 16,94,215 in 1891-92 to Rs. 15,77,202 in 1892-93 can scarcely be considered a proof of successful administration. The explanation may possibly be found in the fact that Collectors have the sole power of fixing the rates at which forest produce may be sold by the Forest Department in their respective districts, but we fail to see why the Forest Department should be called on to supply fuel at a loss of one pie a cubic foot, and minor produce at a loss of ten annas, ten pies per maund. As the Conservators have now no power of control, and are merely inspecting officers, the Forest Member must be held entirely responsible for this fall of revenue, and it is difficult to see how strengthening the subordinate establishment will increase the revenue, as Government supposes it will, if this state of things is allowed to continue; as the amount of revenue realised must necessarily depend on the fads of Collectors. The issue of orders by an outsider to Conservators and District Forest Officers, and a demand for more periodical returns may satisfy the Government

'that this new departure is a success; but we shall require further 'proof to convince us that the present system of administration, in 'which the Conservators have no power whatever, and are merely 'figure-heads, is superior to that advocated by the Committee com-'posed of Messrs. WHITESIDE, W. LOGAN, H. E. STOKES, Sir 'DIETRICH BRANDIS, and Major CAMPBELL-WALKER, and accepted 'by Government in 1882. If the arrangement of 1882, which was 'really a compromise, and gave Conservators in Madras less power 'than was possessed by officers of that grade in other parts of 'India, has not turned out a complete success, it is because too 'little power was given to Conservators, and too much to the Board 'of Revenue. The present arrangement will only intensify the 'evil, for it has taken away from Conservators the little power they 'ever possessed. Continuity of policy is one of the essentials of 'sound forest administration, and this is an impossibility with a fresh 'Forest Member every year,* who is able to reverse all previous 'orders and plans, administer the Department, and work the forests 'according to his own peculiar ideas,—if perchance he has any!"

We hope that this expression of opinion may be read by some of those in authority, and that they may be led to look into the matter, and see what a waste of power it is to have a set of special officers in charge of a special department, but at the same time so to tie their hands and gag their mouths, that they have not only no incentive to work, but no inducement to take any interest in their charges.

As for the rest of the report, we have gone through it, but find very little which is likely to be of any interest to our readers. There are some interesting notes on reproduction which are written by Conservators and not by the Board's Secretary, and these we may refer to later on.

The Timber Trades Journal, Special Issue No. 19.

This imposing thick Volume is an important and interesting issue, which is excellently edited and well got up altogether. There is, added to it, a large and valuable Map of the United States and Canada, which we have consulted with great interest.

The contents of the Volume are very varied, but give an account of the progress of the chief timber trades of the world, with special articles on some of the most important of them.

At page 204 is an account of one of Messrs. Churchill and Sim's Wood-Sales, with vignette portraits of the chief gentlemen who are usually engaged in them either as sellers or buyers. Some of the remarks as to personal characteristics are amusing; and we hope they are found so by the gentlemen concerned.

---

*Mr. Arundel has already left and another Commissioner reigns in his stead, possibly holding entirely opposite views.

HON. ED.

Several pages are devoted to an account of Messrs. Rosenlew's saw-mills at Bjorneborg, in Finland, with excellent illustrations, shewing the pitch of perfection to which a large timber business may be brought with modern appliances and care in management.

At page 217 we find a paper on the 'Douglas Pine' or 'Oregon Pine' as it seems to be called in the trade, which is said, without hesitation, to be 'the wood of the future.' We are glad to hear that the forests of the tree are 'practically inexhaustible,' but we cannot help thinking that even such supplies would be the better for arrangements by which fellings could be regulated so as to ensure that the stock is really permanent, and that the reproduction of the species is not forgotten.

The next article is one on the 'Pitch pine trade,' but it is not very clear what species the pitch pine is, and where it chiefly comes from.

At page 219 is an account of the 'Development of the trade in African Mahogany.' What is African Mahogany ? We are not aware of any species of *Swietenia* in West Africa, and we shall be glad if anyone will tell us what it is. At any rate it would seem, from the very pretty illustrations which accompany the article, that the logs run to very large size, that the wood sometimes fetches as much as 4*s*. 3*d*. per cubic foot, and that in 1893, 4,983,857 cubic feet were imported into Liverpool.

The 'Timber Industry of New Zealand' is the title of an article at page 226, which can only be read with a certain amount of sadness, for there is abundant evidence that conservancy or reproduction are not of account in New Zealand. As regards 'Kauri' we read:—"The supply is expected to last 'another 30 years, all efforts to replant the forests have been 'abandoned, the tree being of such abnormally slow growth that 'after 30 years it has only obtained the dimensions of a shrub." There are several other species mentioned, all of excellent quality; and we only wish we could think that the contending political parties in the Island would agree to carry out the conclusion which was arrived at long ago, that a Conservancy Department was a necessity, and that that Department should be kept outside ordinary politics.

At page 229 is an account of the 'Forestry Exhibit at Earls' Court, 1893,' which we have read with interest. It must have been a rather curious exhibition, something like a real Forest "Old Curiosity Shop," with Mr. Gladstone's axe in the place of honour.

It is rather strange to hear that the male bamboo (*Dendrocalamus strictus*) is becoming limited in supply. In some of our Burma forests, if we are not mistaken, the authorities would be only too delighted if somebody would come and try to extinguish it.

For us, the chief point of remark is the fact, that here once more we have the old, old story about the origins of forest conservancy in South India, with the usual adulation of Major-General James Michael as the first of Indian Foresters. It

seems cruel to say anything against a tradition which his admirers so effusively maintain ; but the real fact is, we believe, that Forest Conservancy (*i.e.*, an attempt at forest management, so to as ensure protection and reproduction, and not merely the felling of timber) in South India was really due to the orders of the Court of Directors of the day on the representations of the Governor, Sir Henry Pottinger ; and it was only when the said Court and Governor grew a little tired of keeping young military gentlemen in the Anamalais to cut timber at a waste of 75 per cent. in the intervals of shikar, that they relieved them, and put in a medical officer of some forest and botanical experience with orders to see what he could do in communication with the Collector of Coimbatore to make arrangements for the protection and reproduction of the forests as well as the extraction of timber. The seven years of incessant exposure were, we believe, productive of an unrivalled collection of shikar trophies, but we doubt if they can show one acre protected from fire, one teak tree planted, or even one big sound teak left standing, because there was not enough advance growth to take its place.

At page 252 we are told regarding 'padouk' that two cargoes were imported last year, as well as several parcels which came to hand indirectly. The wood is said to be steadily making its way and to sell well at 3*s*. to 4*s*. per cubic foot.

It would be impossible to notice even a part of the many other interesting matters which go to fill up this very complete yearly volume, so we will conclude with the following extract regarding the Bombay timber market.

"To give an account of the Bombay timber trade is rather a 'difficult task, as there is so very little to write about.

'The import during the official period 1892-1893 was as 'follows:—

	Quantity. Tons.	Value. Rupees.
'Teak—		
From Siam	2,594	173,613
„ Straits	79	6,915
„ Burmah	80,550	3,414,614
'Junglewood—		
From Straits	3,093	102,609
'Pinewood and timber—		
United Kingdom	570	50,034
Austria	22	1,526
Germany	79	4,353
Italy	2	153
'African wood—		
Mozambique	86	3,350
Zanzibar	31	832
Madagascar	27	550
'Sleepers—		
From Riga, creosoted in London	69,569 cwt.	222,424
52	Total value .	Rs. 3,980,973

'Teak.—By far the largest import is thus seen to be teak, 'owing to being the only kind that can with immunity withstand 'the ravages of white ants.

'Jungle Wood.—Besides teak, a large quantity of so-called 'jungle wood from Singapore and the Malabar coast is used; princi- 'pally for the erection of the cheaper class of native huts, sheds, 'and temporary buildings. It is very seldom cut up, consists of 'several kinds of woods, and prices run between Rs. 40 and Rs. 50 'per ton.

'Pinewood.—Lately deals, battens, and boards, planed and 'rough, in smaller quantities have been imported from the United 'Kingdom and the Baltic; but the quantity is still very insigni- 'ficant; in fact the smallness of the orders necessitate regular 'steam connection, without which the trade would soon die out, 'as the natives generally prefer teak, which they can buy at about 'the same rates.

'Sleepers.—The ports supplying Bombay are Rangoon, Moul- 'mein, and Bangkok. The consumption here is necessarily in- 'creased year by year, following the growth of the city. From 'Bombay there is an export going on to Zanzibar and Mauritius, 'but is too small to be specially noticed. Both timber and scantl- 'ings are imported, and prices range:—Timber, Rs. 50 to Rs. 60 'scantlings, Rs. 70 to Rs. 115 per ton of 50 cubic feet, all c.i f. 'Bombay. The size of the timber is generally 9 in., 10 in., and '12 in. square, 20 ft. and up long, and scantlings, 3 × 3, 4 × 4, '6 × 6; 12 ft. and up in length, all good, sound, and merchantable, 'fresh cut.

'Now and then an inquiry for creosoted sleepers appears in 'the market, when railway building is going on up country; but, as 'a rule, people prefer steel pans on account of the baneful climatic 'influence on any softer material.

'In Bombay there is only one saw-mill, belonging to Mr. Alex. 'McKenzie, a gentleman well-known for his energy and enterprise. 'In the wood bazaar only native buyers are met with, and stocks 'amounting to several lakhs can be seen stowed away in sheds 'covered with palm leaves. The peculiarity with these natives is, 'that they never insure their goods, having an implicit faith in '"Kismet." This belief received a rude shock a month ago, 'when a large fire took place, destroying about Rs. 400,000 worth, 'principally teak, and it was a sad sight to behold the ruined 'merchants sitting crying before the smouldering ashes.

'In Europe, the competitors would have contemplated this 'destruction with rather indifferent eyes, and certainly done no- 'thing to create fresh starts for their ruined trade brethren. Here 'a collection was made by the trade, and they are all started again. 'The East and the West look at things from different points 'of view."

VI.-EXTRACTS, NOTES AND QUERIES.

A Forest School for Ceylon.

The supplement to the *Tropical Agriculturist* of February last has a note saying that it is proposed to start a school of Forestry in connection with the school of agriculture in Colombo. We hope that this means that the Government of the Colony is going to work the Department properly and put its officers on a proper footing in relation to those of the Revenue Department, at the same time as it constitutes a proper forest estate to be placed under Working Plans of a suitable character.

Artificial Indiarubber from Cotton Seed.

A note in the supplement to the *Tropical Agriculturist* says that a process has been discovered by which a small quantity of Indiarubber (15 per cent. of the whole, it is said) can, with the addition of cotton seed oil, be made to produce an article equal in every way to the genuine indiarubber. Thoroughly efficient and cheap substitutes for both indiarubber and guttapercha are badly wanted, for the use of both these substances are so largely increasing, while at the same time the supply seem to be falling off, so that, whether or no the report about the cotton-oil is true or not, it is clear that the chemists ought to work out the subject.

Mercantile aspect of Forestry.

Mr. W. R. Fisher, Assistant Professor of Forestry at Coopers' Hill College, writes to the *Field*:—In these days of agricultural depression the paper published in the *Field*, and recommending extensive planting of ash, is very welcome; and there can be no doubt that ash is a rare tree on the Continent, and that its value,

is steadily increasing. At the same time, it will only yield fine timber on moist and fairly deep soil, and will not thrive on dry plateaux or shallow soils.

The calculation of 3,000 cubic feet ash timber on an acre in forty years can hardly be accepted for soils of average quality. The ash tree will not ordinarily yield a maximum quality of useful timber under sixty years; and much of the timber at forty years would be immature branch wood.

As regards oak, English oak can compete in quality and in rapidity of growth with that produced on the Continent; but only on condition that it be properly grown—that is, in mixed, high forests with beech: for oak grown in coppice with standards, as is the custom with us, will never produce the finer kinds of even-grained oak timber, which the dense growth of the Continental high forests supplies. English oak grown in a more open manner will, however, prove more durable and tenacious than Continental oak when grown in the denser way. There is, amongst other similar trees, a fine oak in the Windsor Forest, which has been grown with beech in High Forest, and at the age of 160 years contains upwards of 200 cubic feet of splendid timber, worth at least 2*s.*6*d.* a cubic foot, or £25. As a fact, £100 was once offered for this tree to form a 60 ft. keel for a schooner.

It would be a mistake to reckon on a permanent supply of oak timber from the Continent of Europe. It is true that the oak forests of Germany and France are splendidly managed; but, even so, these countries, and especially France, have to import oak timber for their own requirements, and Germany is much richer in conifers and beech than in oak. What is termed Austrian oak comes chiefly from Croatia, Illyria, Servia, and other Eastern countries where strict forest conservancy is not yet altogether satisfactory; and the present rate of supply cannot last very much longer It would also be a mistake to imagine that the Russian sources of oak supply have not been already greatly reduced.

The figures in the former paper regarding remunerative forestry in Baden and at Rouen do not supply the areas of the forests in question, and are not, therefore, very instructive; but it is a fact that in the highly industrial countries of Belgium and Saxony forest lands will pay 20*s.* an acre per annum, after deducting all expenses of management; and last year, in a private forest in the Belgian Ardennes, near St. Hubert, 17½ acres of forty years old Scotch pine were sold standing for 24,000 frs. or £960, to be used as mine props at a distance of about 130 miles by rail. This gives about £55 per acre, or, allowing interest at 3 per cent. per annum, a clear annual profit of 16*s.* per acre, excluding the value of thinnings which have been made, but the amount obtainable from which is not now ascertainable. These woods cost nothing to plant, as the custom in the Ardennes is to let the land for growing rye for one year after felling, and this pays, for the sowing up

with pine seed, which is done either with the rye or in the spring after the rye has been sown, the pine seedings growing up under the rye, and being left with the stubble after the harvest. Six pounds of pine seed per acre, at about 4*s.* a pound is sufficient; and sowing is preferred to planting after the harvest, on account of the drought to which transplants may be exposed on these hill-sides. (*Timber Trades Journal.*)

Seeding of Forest Trees.

The Conservator of Forests, Central Circle, N.-W. P. and Oudh, informs us that *Bijasar* (*Pterocarpus Marsupium*) is fruiting heavily this year in Kumaon as is the *Sain* (*Terminalia tomentosa*). Mr. H. French writes from the Darjeeling Hills that the *Tama* bamboo (*Dendrocalamus Hamiltonii*), has seeded profusely this year, and that seed is available.

VII—TIMBER AND PRODUCE TRADE.

The Indian Timber Trade.

CALCUTTA, *February 21st 1894.*

The timber trade of this port is not very active now, as Burma is exporting largely to Bombay. The demand for teak has risen there; besides the European markets are having heavy supplies on account of the reported activity in the home and private dockyards. Squared logs only are imported into Calcutta, very seldom round logs; price at present, Rs. 90 to 100 per ton of 50 c. ft.; scantlings, invoice of assorted sizes, running from 1 × 2 to 3 × 12, 5 ft. and upwards, price Rs. 70 to 80 per ton.

Now that the hot weather is rapidly approaching, the trade will decline, but become active as soon as the rains are over, probably in October.

Government and railway companies usually issue tenders now for the supply of teak, which close at the end of this month.

Teak is the chief wood which is largely imported and extensively used for all wood work.

Pine comes occasionally to this port from America, but is not a favourite on account of its great attraction for white ants, which

are very destructive. At present a shipment of Oregon red pine is being moved off very slowly; it was landed in the early part of last year ex American ship "Yarkand," and consisted of 1 in. boards, 2 in. and 3 in. deals, and square logs.

Indigenous Woods.—Sál, a hard wood in respect to the Burmah padouk, is the chief wood for building purposes. Soondry and Sissoo, two other hard woods, are chiefly used in carriage and cart manufacture. There are many more which might be turned to account, but for the want of good communication between railroad and forests. The scanty supplies that do come to hand are poor in quality and irregularly sawn by hand pit-saws after the old method shown in your Timber Merchants' Office Calender, 1894.

Box-making.—This is an extensive trade, and is entirely in the hands of natives, who are in the habit of buying up all the old packing boxes from firms and cutting them up. This is, indeed, a line of business which if headed by English enterprise and capital would pay. A mill, with all the machinery required for the trade, could supply the Government Stationery Department, the Medical Stores, H. M.'s Mint, the Telegraph Department, General Post Office—for whom the Pioneer Saw-mills have now an order in hand—besides many large firms trades and hotels, too.

Referring to an article on tea boxes in one of our recent issues, I add my quota of experience. Tea boxes were first made of teak bundled into shooks and imported from Burmah into the tea-growing districts of Assam. About a million yearly would be imported; for a long time garden managers would use nothing but teak; these were supplanted by the Burmese cedar boxes, which cost about two-thirds the price of teak. These have been still further competed with by the wood of the cotten trees (Simul), which grows largely in the lower regions of the Himalayas. These are felled by hand by the Meris and Nagas, wild hill tribes, and floated down in rafts on the Brahmaputra River to the few saw-mills in Upper Assam, where I was manager and engineer to one of these box-making mills. The wood of the cotton tree is almost universally liked by garden managers as its seasons quickly, yields to the nail, and is very light. The logs are quickly cut up when hauled up from the river, ripped up in the frame-saw, then cut in blocks by the cross-cut saw to the length and breadth of the box, then to the small circular saw benches, of which there are about six, to cut the blocks to ½ in. boards, and then removed to some sunny spot and sandy ground for atmospheric drying. I have handled and cut up these blocks myself whilst they were dripping with sap and water, yet a few hours drying out in the sun and on sand would absorb all, and make the boards light as a feather.

Wine cases another line in box-making are which might be developed. Firms here will not wait for the slow process of hand-made boxes, and some have recently written to Swedish firms for supplies.

Soap boxes are urgently wanted for one of the leading soap manufactories here. One has just imported 43,000 boxes at from 2 to 5 annas apiece.

Mr. G. Barton, who has a head office and furniture show rooms at 8, Bow Bazar Street, Calcutta; cabinet workshop in South Road, Entally; saw-mills and timber yard, Howrah, possesses a small business which would bear extension if backed by English capital. He has been brought up to his work in one of the largest saw-mills there, where they had about twenty-five various wood-working machines, and could turn out woodwork of any kind from furuiture to doors and windows. Labour is very cheap, native carpenters can be had at from 8 to 12 annas per day—*7d.* to *10d.*—but the work is slow and inferior. There is no reason why a saw-mill should not pay here. The one referred to paid well, but closed on the death of the proprietor. Sawing for the trade is profitable here. There is no reason why round logs should not be imported from Burmah, and sawn into scantlings for market consumption instead of the timber merchant having to pay Rs. 10 per ton more in freight, *plus* a higher rate for landing and stacking cargo.

There are two small mills owned by natives having Messrs. Thomas Robinson and Son's machines, and one or two of the shipbuilding yards have a frame saw and a couple of benches to do their own work.

IMPORTS OR TIMBER INTO THE PORT OF CALCUTTA FOR THREE YEARS.

	1890		1891.		1892.	
Month	Tons	Rupees	Tons	Rupees	Tons	Rupees
April ...	953	41,159	... 1,653	67,522	... 1,174	41,275
May ...	1,784	67,225	... 1,815	94,881	... 1,399	74,394
June ...	1.136	59,038	... 832	42,553	... 731	34.409
July ...	1,549	47,610	... 2,465	115,403	... 643	28,311
August ...	962	64,114	... 1,297	66,750	... 1,739	95,622
September ..	1,821	124,818	... 1,377	49,358	... 784	38,719
October ...	1,011	52,788	... 1,173	59,788	... 822	34,053
November ...	1,515	81,128	... 1,720	77,640	... 2,869	158,734
December ...	1,938	119,521	... 960	50,093	... 1,067	48,634
January ...	1,277	49,897	... 788	37,339	... 625	29,539
February ...	1,085	45,832	... 1,030	45,805	.. 907	38,567
March ...	1,483	72,133	... 893	38,427	... 1,509	86,806
	16,514	915,263	16,003	744,959	14,669	709,063

Total for three years { Tons 47,186 / Rupees 2,369,285.

(*Timber Trades Journal.*)

NOTE.—We extract the above article, though we have a good deal of doubt of some of the writer's remarks.

HON. ED.

Churchill and Sim's Circular.

5th April 1894.

EAST INDIA TEAK.—The deliveries for the first three months have amounted to 3,568 loads against 2,771 loads in the corresponding period of last year. For March alone they are 1,034 against 1,370 in 1893. Prices for stocks in the Docks have been about stationary, but higher prices are obtainable for special sized logs of good quality. Planks continue in good demand, and shipments are readily saleable at the present low rates. There has been little business in cargoes afloat, sellers being still sanguine as to future prospects, and unwilling to meet buyer's views unless with shipments close at hand

ROSEWOOD —Is only saleable occasionally, and at low prices.

SATINWOOD—Large and figury logs would realize good prices but for small, plain wood there is scarcely any demand.

EBONY—Moderate imports of good logs would sell well.

PRICE CURRENT.

Indian Teak	per load	£9-10s.	to	£16.
Satinwood	per foot superfical	6d	to	12d.
Rosewood	„ ton	£5.	to	£8
Ebony	„ „	£6.	to	£8

MARKET RATES OF PRODUCTS.

(*Tropical Agriculturist, April 1894.*)

Cardamoms,	per ℔.	2s.	to	2s.6d.
Croton seeds	per cwt.	20s.	to	27s.6d
Cutch	„	20s.	to	32s.
Gum Arabic, Madras	„	15s.	to	30s.
Gum Kino	„	£15	to	£18.
India Rubber, Assam	per ℔.	1s.7d.	to	2s.3½d.
„ Burma	„	1s.7d.	to	1s.11d
Myrabolams, Bombay	per cwt	8s.6d.	to	10s.6d.
„ „	„	4s.	to	4s.9d.
„ Godavari	„	6s.3d.	to	7s.
Nux Vomica, good	„	6s.	to	11s.
Orchella, Ceylon	„	15s.	to	22s.
Redwood	per ton	£3.	to	£3-10s.
Sandalwood, logs	„	£35	to	£55
„ chips	„	£9	to	£30

The Teak Market.

Richardson and Cruddas' Price List, Bombay, *March*, 1894.

TIMBER, VARIOUS.—	per ton of 50 cubic feet.	
Teak Logs and Beams, 1st Class, Selected—	Rs.	Rs.
under 12″ Sidings	87 to	105
12″ to 15″ do.	105 „	113
Over 15″ do.	110 „	118

	Per cubic foot.	
Teak Sleepers and Girder Beds, cut to sizes and lengths.	Rs.	As.
Under 12″ wide	2	8
12″ to 15″ wide	2	12
Over 15″ to 18″ wide	3	2

	Per cubic foot.	
Teak Planks, cut to sizes and lengths—	Rs.	As.
Under 12″ wide + over 2″ to 3″ thick ...	2	14
12″ to 15″ do. + do. do. do. ...	3	6
15″ „ 18″ do. + do. do. do. ...	3	12

Cawnpore Price Current.

March 29th, 1894.

	Per Maund.						
	Rs.	A.	P.		Rs.	A.	P.
Aonla fruits, dried	0	12	0	to	0	12	6
„ leaves, dried bruised ...	1	12	0	to	2	0	0
Babul Bark	0	7	0	to	0	8	0
Bahera	1	12	0	to	1	14	0
Lac, Stick	24	0	0	to	25	0	0
Myrabolams	3	0	0	to	3	8	0
Moonj Grass	0	8	0	to	0	9	0
Gum, Babul	13	0	0	to	13	8	0
„ Mixed	9	0	0	to	10	0	0

Statement of average selling rates of timber and bamboos in Meerut, Cawnpore, Bulandshahr, Bareilly and Moradabad for the quarter, ending 31st March 1894.

Description.	Timber Scantlings per score.		Bamboos per 100 score.		REMARKS.
	From	To	From	To	
MEERUT.	R. A. P.	R. A. P.	R. A. P.	R. A. P.	
Sal 10′ Tors (Poles) ...	8 0 0	18 0 0	...	...	
Sal & Sain, &c., Karris, 12′ × 5″ × 4″ ...	25 0 0	40 0 0	...	...	
Sal bed posts, 7′ × 2½″ × 2½″ ...	10 0 0	12 0 0	...	...	
Bamboos of 9′ to 10′ per 100 score ...	...	...	40 0 0	100 0 0	
CAWNPORE.					
Sal 10′ Tors (Poles) ...	5 0 0	6 0 0	...	...	
Sal, & Sain, &c., Karris, 12′ × 5″ × 4″ ...	25 0 0	80 0 0	...	...	
Sal bed posts 7′ × 2½″ × 2½″ ...	12 0 0	15 0 0	...	...	
Bamboos of 9′ to 10′ per 100 score	...	...	25 0 0 30 0 0 50 0 0	30 0 0 50 0 0 100 0 0	
BULANDSHAHR.					
Sal 10′ Tors (Poles) ...	...	...	...	..	
Sal and Sain, &c., Karris, 12′ × 5″ × 4″ ...	...	...	...	...	
Sal bed posts, 7′ × 2½″ × 2½″ ...	...	...	...	..	
Bamboos of 9′ to 10′ per 100 score ...	...		80 0 0	90 0 0	
BAREILLY.					
Sal 10′ Tors (Poles) ...	5 0 0	10 0 0	...	..	
Sal & Sain, &c., Karris, 12′ × 5″ × 4″	25 0 0 40 0 0	35 0 0 50 0 0 60 0 0	.. ..	.. . ...	
Sal bed posts 7′ × 2½″ × 2½″ ..	10 0 0	15 0 0	.	...	
Bamboos of 9′ to 10′ per 100 score ...	...	..	50 0 0	137 0 0	
MORADABAD.					
Sal 10′ Tors (Poles) ...	20 0 0	25 0 0	...	...	
Sal & Sain, &c., Karris 12′ × 5′ × 4″ ...	30 0 0	50 0 0	...	...	
Sal bed posts 7 × 2½″ × 2½″ ..	0 8 0	0 10 0	...	...	
Bamboos of 9′ to 10′ per 100 score ...	...	...	50 0 0	100 0 0	

X.—EXTRACTS FROM OFFICIAL GAZETTES.

1.—Gazette of India.

27th March, 1894 No. 354F.—With reference to the Notification of this Department, No. 199-F., dated the 15th ultimo, Mr. Ribbentrop resumed charge, on return from privilege leave, of the Office of Inspector-General of Forests, on the forenoon of 22nd March, 1894, from which date Mr. Hill reverted to his appointment of Conservator of the Central Forest Circle in the North-Western Provinces and Oudh.

11th April, 1894. No. 178F—Major C. T. Bingham, I S. C., Conservator of Forests, 3rd grade, Tenasserim Circle, Lower Burma, is granted, under Article 282 (*a*) (i), Civil Service Regulations, privilege leave for three months and fifteen days, with effect from 1st March 1894.

2—Madras Gazette.

19th March, 1884.—The leave of absence sanctioned to Ranger R. Jambunada Sostri and notified at page 216. Part II, of the *Fort St. George Gazette*, dated 20th February 1894, is further extended up to 25th May 1894.

27th March 1894. No. 146.—Mr. R. McIntosh, District Forest Officer, Cuddapah, is granted privilege leave for three months, with effect from or after 20th April 1894, under Article 291 of the Civil Service Regulations.

2nd April, 1894. No. 148,—Mr. C. D. P. Thornton, District Forest Officer, Tinnevelly, is granted privilege leave for three months, from or after the 2nd instant, under Article 291 of the Civil Service Regulations.

2nd April, 1894. No. 150.—

No.	Name of Officer.	District.	Name of charge.
	Mr. S. C. Moss.	Tinnevelly	To act as District Forest Officer during the absence of Mr. Thornton on leave

2nd April, 1894,—R. Visvanatham Pantulu, Forest Ranger, Godavari District, is granted privilege leave for one month, with effect from 15th April 1894, or from the date of availing himself of the same.

3rd April, 1894. No. 151.—

No	Name of Officer	District.	Nature of charge.	Remarks.
1	Mr. C. G. Douglas, Deputy Conservator of Forests, First Grade.	Nilgiris	District Forest Officer.	To join on return from furlough.
2	Mr. T.G.A. Gaudoin, Extra Assistant Conservator of Forests, Fourth Grade.	Cuddapah	Acting District Forest Officer.	To act during the absence of Mr. R. McIntosh on leave.

9th April, 1894—Acting Ranger N. Nagarazu, Vizagapatam District, is reduced from Acting Ranger, 5th Grade, to Forester, 1st Grade, for three months, from 1st April 1894, * * * *

Eggia Narayana Sastri, Forester, 1st Grade, Anantapur District, is promoted to Ranger, 5th Grade, for three months, from the 1st April 1894.

11th April 1894. No. 177.—Mr. W. C. McMurray, Forest Settlement Officer, North Arcot, &c., districts, is granted privilege leave for two months, with effect from or after the 16th April 1894, under Article 291 of the Civil Service Regulations.

13th April, 1894. No. 178.—Mr. Rhodes Morgan, District Forest Officer, Nilgiris, is granted privilege leave for three months, under Article 291 of the Civil Service Regulations, with effect from the date of his relief by Mr. Douglas.

14th April 1894.—The Board of Revenue has granted one month's privilege leave, under Article 291 of the Civil Service Regulations, to Mr. H. B. Bryant, District Forest Officer, South Coimbatore, with effect from or after 2nd May next.

15th April 1894.—Mr. C. P. Howell, Sub Assistant Conservator of Forests on Rs. 150, is granted leave on medical certificate for one year, under Article 369 of the Civil Service Regulations, with effect from the 23rd January 1894.

3.—Bombay Gazette—

31st March 1894.—Mr. Waman Ramchandra Gaunde, Extra Assistant Conservator of Forests, First Grade, returned to duty from the furlough granted to him under Government Resolution No. 8844, dated 1st December last, Revenue Department, and received charge of the Sub-Division Forest Office, Násik, on the 13th instant, before office hours.

Mr. B. H. Dalal, L C.E., Extra-Assistant Conservator of Forests, returned to duty from the privilege leave granted to him by the Conservator of Forests, C. C., in Notification dated 26th January 1894, published at page 86 of the *Bombay Government Gazette* of the 1st February 1894, and received charge of the Sub-Division Forest Office, West Khándesh, on the 12th February last, before office hours.

2nd April 1894.—Mr. W. A. Wallinger, Divisional Forest Officer, Surat, delivered over and Mr. Chunilal Gulabchand Dalia, Acting Extra Assistant Conservator of Forests, Fourth Grade, received charge of the Surat Sub-Division Forest Office on the 16th February 1894, in the afternoon.

10th April 1894. No. 2492.—Mr. W. G. Betham, Acting Deputy Conservator of Forests, First Grade, and Divisional Forest Officer, Násik, is allowed privilege leave of absence for three months from 14th Apri 1894.

11th April 1894. No. 2559.—His Excellency the Governor in Council is pleased to make the following appointments :—

Mr R. C. Wroughton, on return from leave, to do duty as Deputy Conservator of Forests in charge Northern Circle.

Mr. Frámji Rastamji Desái, on relief, to do duty as Divisional Forest Officer, Násik, Mr. L. S. Osmaston holding charge meanwhile.

13th April 1894. No. 2627.—Mr. J. H. Clabby, Extra Assistant Conservator of Forests, Third Grade, is allowed leave on medical certificate out of India for six months.

Mr. T. B. Fry to act as Divisional Forest Officer, Dharwár, during the absence of Mr. W. R. Woodrow, or pending further orders.

Mr. G. P. Millett to hold charge temporarily of the Working Plans Office, N. C. Thána, in addition to his own duties.

16th April 1894.—Mr. G. P. Millett, Deputy Conservator of Forests, Fourth Grade, delivered, and Mr. T. B. Fry, Deputy Conservator of Forests, Second Grade, and Divisional Forest Officer, Working Plans, N. C., received, charge of the Divisional Forest Office, West Thána, on the 10th April 1894, in the afternoon.

23rd April 1894.—Mr. E. G. Oliver, Deputy Conservator of Forests, Fourth Grade, and Divisional Forest Officer of Sholapur, having delivered over charge of his office to Mr. Waman Ramchandra Gaunde, Extra Assistant Conservator of Forests, First Grade, on the 16th instant after office hours, proceeded on one month's privilege leave granted to him.

Mr. W. G. Betham, Acting Deputy Conservator of Forests, First Grade, and Divisional Forest Officer of Nasik, having delivered over charge of his office on the 13th instant, after office hours, to Mr. L. S. Osmaston, Divisional Forest Officer, Working Plans, proceeded on three months' privilege leave granted to him under Government Resolution No. 2492, dated 10th idem, in the Revenue Department.

24th April 1894.—Messrs. B. H. Dalal, L.C.E., and Vaman Gopal Tumu respectively delivered over and received charge of the Sub-Division Forest Office, West Khandesh, on the 10th instant, after office hours.

Mr. Waman Ramchandra Gaunde, Sub-Divisional Forest Officer of Násik, delivered over, and Mr. Vishnu Mahadeo Tilak, Acting Extra Assistant Conservator of Forests, received, charge of the Nasik Sub-Division Office on the 12th instant, after office hours.

Mr. Vishnu Mahadeo Tilak having been appointed Acting Extra Assistant Conservator of Forests, Fourth Grade, under Government Resolution No. 2174, dated 26th March 1894, in the Revenue Department, reported himself for duty to the undersigned in his new appointment, on the 27th idem, before office hours.

4.—Bengal Gazette—

16th April 1894. No. 2,077.—In continuation of Notification No. 168For., dated the 10th January 1894, it is hereby notified that Mr. F. Trafford, Assistant Conservator of Forests, has been granted a further extension of leave for six days, without pay, by the Secretary of State.

19th April 1894 No 2213.—Mr. R. Quinnell, Extra Assistant Conservator of Forests, in charge of the Chittagong Forest Division, is granted three months' privilege leave, under Article 291 of the Civil Service Regulations, with effect from the 30th April 1894, or any subsequent date on which he may avail himself of it.

23rd April 1894. No. 2257.—Mr. H. H. Davis, Deputy Conservator of Forests, 1st grade, having been appointed to officiate as Conserva

tor of Forests, 3rd grade, and to take charge of the Bengal Forest Circle until relieved by Mr. A. E. Wild, the following promotions are hereby made in the Upper Controlling Staff of the Forest Department in Bengal, with effect from the 23rd February 1894 :—

Mr. E. G. Chester, Deputy Conservator of Forests, 2nd grade, to officiate in the first grade of Deputy Conservators.

Mr. G. A. Richardson, Deputy Conservator of Forests, 3rd grade, to officiate in the 2nd grade of Deputy Conservators.

Mr. R L. Heinig, Deputy Conservator of Forests, 4th grade, to officiate in the 3rd grade of Deputy Conservators.

Mr. W. H, Lovegrove, Assistant Conservator of Forests, 1st grade, to officiate in the 4th grade of Deputy Conservators.

23*rd April* 1894. No. 2258.—Mr. A. E. Wild, Officiating Conservator of Forests, 2nd grade, and Conservator of Forests, 3rd grade, having assumed charge of the Bengal Forest Circle on the afternoon of the 7th April 1894, the following reversions of officers of the Upper Controlling Staff of the Bengal Forest Department are hereby ordered, with effect from that date :—

Mr. H. H. Davis, Officiating Conservator of Forests, 3rd grade, to revert to the 1st grade of Deputy Conservators.

Mr. E. G. Chester, Officiating Depnty Conservator of Forests, 1st grade, to revert to the 2nd grade of Deputy Conservators.

Mr. G. A. Richardson, Officiating Deputy Conservator of Forests, 2nd grade, to revert to the 3rd grade of Deputy Conservators.

Mr. R. L. Heinig, Officiating Deputy Conservator of Forests, 3rd grade, to revert to the 4th grade af Deputy Conservators.

Mr. W. H. Lovegrove, Officiating Deputy Conservator of Forests, 4th grade, to revert to the 1st grade of Assistant Conservators.

5.—N. W.-P. AND OUDH GAZETTE.

10*th April* 1894. No. $\frac{1201}{11-651B}$. —Lála Har Swarup, Extra Assistant Conservator of Forests, from the Bahraich to the Gorakhpur Forest Division in the Oudh Circle.

6.—PUNJAB GAZETTE.

11*th April* 1894. No. 229—Bhái Sadhu Singh, Extra Assistant Conservator of Forests, Punjab, is posted to the Jhelum Forest Division for work in connection with the Forest Settlement of Rakhs in the Shahpur District, with effect from the afternoon of the 23rd March 1894.

7.—CENTRAL PROVINCES GAZETTE.

29*th March* 1894. No. 1554.—Mr. L. A. W. Rind, Deputy Conservator of Forests, Narsingpur, availed himself, on the afternoon of the 8th instant, of the two months and twenty-nine days' privilege leave granted him by Order No. 636, dated the 8th February 1894, making over charge of his duties to Mr. Mahomed Kadar Baksh, Extra Assistant Conservator.

5th April 1894. No 1671 —With reference to Order No. 1133, dated the 6th ultimo, Mr. W. G. Gilmore, Forest Ranger, and the Deputy Commissioner, Chhindwara, respectively assumed and surrendered charge of the Chhindwara Forest Division on the forenoon of the 21st ultimo.

5th April 1894. No. 1672.—Mr. P. H. Clutterbuck, Officiating Deputy Conservator of Forests, and Working Plans Officer, availed himself, on the forenoon of the 5th ultimo, of the six months' leave on urgent private affairs granted him by Order No. 1132, dated the 6th March 1894, making over charge of the Chhindwara Forest Division to the Deputy Commissioner, Chhindwara.

Mr. Clutterbuck reported his departure from Bombay on the 20th ultimo

Order No. 1490, dated the 21st March 1894, is hereby cancelled.

10th April 1894. No. 1744 —Dr. E. Dobbs, Deputy Conservator of Forests, in charge of the Nagpur-Wardha Forest Division, is appointed to hold charge of the current duties of the office of Conservator of Forests, Southern Circle, Central Provinces, in addition to his own duties, with effect from the date of receiving charge from Colonel Doveton.

12th April 1894. No. 1811.—Mr. W. P. Thomas, Deputy Conservator of Forests, Hoshangabad, availed himself, on the afternoon of the 21st March 1894, of subsidiary leave preparatory to the one year's furlough granted him under Order No. 1226, dated the 8th March 1894, making over charge of the Hoshangabad Forest Division to Mr. A. M. F Caccia, Assistant Conservator of Forests.

No. 1812 —Mr. W. P. Thomas, Deputy Conservator of Forests, reported his departure from Bombay per P. & O. s.s. *Clyde*, on the 24th March 1894, on one year's furlough.

8—BURMA GAZETTE.

24th March 1894. No. 7.—With reference to Revenue Department Notification No. 20F., dated the 25th January 1894, Mr. H. B. Anthony, Deputy Conservator, made over, and Mr. F. W. Thellusson, Deputy Conservator, received, charge of the Thayetmyo Forest division on the forenoon of the 20th March 1894.

26th March 1894. No 5.—With reference to Revenue Department Notification No. 94 (Forests), dated the 12th March, 1894 Mr. F. W. Thellusson, Deputy Conservator of Forests, made over, and Mr. A. M. Burn-Murdoch, Assistant Conservator of Forests, received, charge as a temporary measure of the Minbu Forest division on the forenoon of the 18th March 1894 in addition to his other duties.

26th March 1894. No. 112.—Mr. C. S. Rogers, Temporary Forest Ranger, is appointed to be an Extra Assistant Conservator of Forests, 4th grade.

30th March 1894. No. 6 —With reference to Revenue Department Notification No. 85 (Forests), dated the 24th February 1894, Mr. A. M. Burn-Murdoch, Assistant Conservator of Forests, made over, and Mr. W. T. T. McHarg, Assistant Conservator of Forests, assumed, charge of the Minbu Forest division on the afternoon of the 26th March 1894.

3rd April 1894 No. 7.—With reference to the Revenue Department Notification No. 85 (Forests), dated the 24th February 1894, M. T. H. Aplin, Deputy Conservator of Forests, made over, and Mr. H. B. Anthony, Deputy Conservator of Forests, assumed, charge of the Lower Chindwin Forest Division on the forenoon of the 31st March 1894.

4th April 1894. No. 133.—Mr. F. J. Branthwaite, Assistant Conservator of Forests, was on special duties in the Toungoo Forest division from the 16th January to the 21st March 1894, both days inclusive.

6th April 1894. No. 136.—Mr F. B. Dickinson, Deputy Conservator of Forests, reported his arrival in Rangoon on the 6th April 1894, before noon.

10th April 1894. No. 8.—Preparatory to his retirement from service Maung We, Extra Assistant Conservator of Forests, made over, and Mr. E B. Powell, Extra Assistant Conservator of Forests, received, charge of the South Tharrawaddy subdivision on the afternoon of the 4th April 1894.

1.th April 1894. No. 147.—Mr. A. L. Home, Conservator of Forest, Western Circle, was placed in charge of the Direction division of the Eastern Circle from the 9th March to the 7th April 1894, both days inclusive, in addition to his other duties.

16th April 1894. No. 2.—Mr. G. F. R. Blackwell, Deputy Conservator of Forests, made over, and Mr. A. Weston, Deputy Conservator of Forests, received, charge of, the Kado division, on the forenoon of the 14th April 1894.

9.—Assam Gazette.

17th April 1894. No. 273G.—In consequence of the departure on furlough of Babu Jogesvar Sur, Extra Assistant Conservator of Forests, Fourth Grade, Babu Nilkanta Mukharji, Forest Ranger, Fifth Grade, is appointed to officiate as an Extra Assistant Conservator of Forests, Fourth Grade, with effect from the 1st April 1894.

20th April 1894. No. 3943G.—Babu Nilkanta Mukharji, Officiating Extra Assistant Conservator of Forests, Fourth Grade, is placed temporarily in charge of the Kamrup Forest Division, *vice* Mr. H. G. Young, Deputy Conservator of Forests, who was granted furlough for one year in Notification No. 1644G., dated the 20th February 1894. Notification No. 1645G., dated the 20th February 1894, published at page 126 of the *Assam Gazette* of the 24th idem, is hereby cancelled.

10.—Hyderabad Residency Gazette.

22nd March 1894. No. 99.—Mr. W. G. J. Peake, Forest Ranger, is appointed to be a Probationary Extra Assistant Conservator of Forests in Berar on Rs 150 per mensem, with effect from the 10th January 1894.

11.—MYSORE STATE GAZETTE.

27th March 1894. No. 16251G. 3581—Under Article 181 of the Mysore Service Regulations, Mr. C. Narain Rao, Assistant Conservator of Forests, Shimoga, is granted privilege leave of absence for one and a half months from the 22nd instant

2. Mr. B. Srinivasa Rao, Sub-Assistant Conservator of Forests, Shikarpur Sub-Division, is appointed to act as Assistant Conservator of Forests, 3rd Grade, during the absence of Mr. C. Narain Rao on privilege leave, or until further orders.

3. Mr. C. Appaiya, Forest Probationer, Shimoga District, will be in charge of the Shikarpur Sub-Division during the absence of Mr. B. Srinivasa Rao on other duty.

17th April 1894. No. 17552G. 3854.—The two months' privilege leave granted to Mr. Venkatnaranappa, Sub-Assistant Conservator of Forests, Tumkur District, in Notification No. 15768—3476, dated 19th March 1894, is hereby extended by 9 days.